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Preparing Portfolios for the Age of Inflation

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Asset Class Performance Under Periods of Inflation and Disinflation

Although inflation risk does not quite rank as highly as the risk of permanent loss of capital, it should be a persistent worry to investors. Unless addressed, inflation can act as an insidious tax on wealth. Financial planners are fond of citing the compounding effects of wealth creation but, it should be remembered that negligible investment returns in an inflationary headwind leads to compounding operating in reverse.

An insidious tax on wealth

John Authers, the FT Columnist, suggested: "Rather than a balance between equities and bonds investors might, for example, seek a balance between assets that would do well under inflation or deflation. The hunt for uncorrelated asset classes, just because they have historically been uncorrelated, should be over."

In this note we study the performances of traditional asset classes such as equities, bonds and bills, as well as alternative asset classes including commodities, inflation-linked bonds and real estate under market scenarios of high inflation, moderate inflation, disinflation and finally deflation.

Inflation and its Impact

Inflation is the rise in the price of goods, services and/or wages over time, which can also be recognised as the loss of purchasing power of money or the loss of earnings ability of an investment. The dictionary definition of inflation is "A continuing rise in the general price level usually attributed to an increase in the volume of money and credit relative to available goods and services" (Merriam-Webster).

Deflation is the opposite of inflation, it is the reduction in the price of goods and services, and is recognised when the inflation rate falls to and below zero. Deflation rarely happens, but when it does, it often has a catastrophic effect on asset prices, causing destruction in value.

Other scenarios include disinflation and reflation. The former marks a period of decreasing inflation, often seen when the economy is steering towards stagnation, and the latter traditionally occurs during recovery from a recession.

Inflation is prone to sudden escalation as a result of economic shocks, making its effects especially acute. The sources of inflation can largely be explained in terms of either monetary policy, where excess money supply is injected into the market, devaluing the currency and causing prices to rise - such as the war period of the 1940s - or price-driven. For instance during the extended inflationary period of the 1970s, as a consequence of supply-demand imbalances mainly caused by the oil price shock, where price increases in assets such as commodities can flow through to other goods, leading to general inflation.

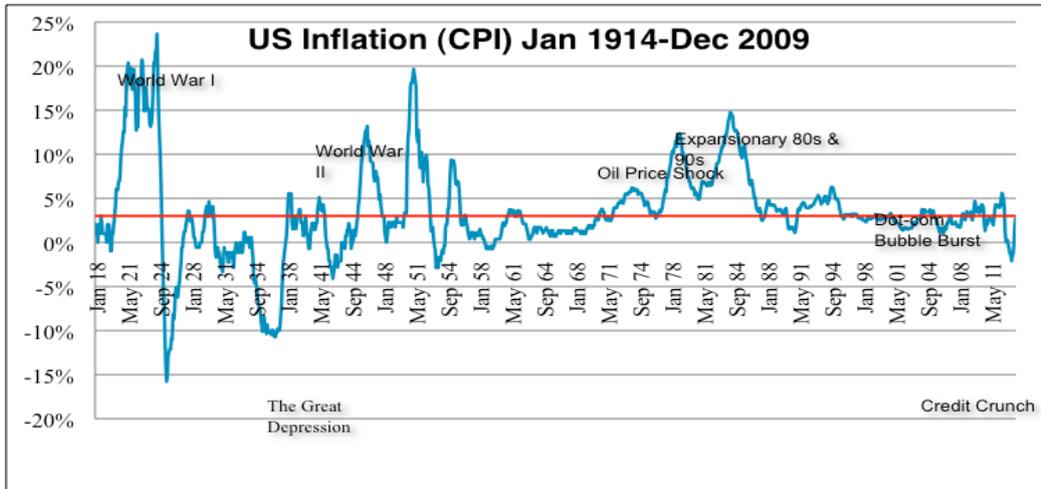
The impact of inflation on assets differs markedly from regime to regime and is subject to different conditions such as: the length of holding periods/time horizon, expected inflation versus unexpected inflation, government regimes (passive versus pre-emptive), and finally valuation. All of the above comprises the core criteria for assessing what dangers inflation can inflict upon a portfolio of assets.

Deflation and its Impact

Since deflation is such a rare occurrence, the effect of inflation tends to become permanent. There has been several short isolated periods of deflation in the US, but only one prolonged period exists in the 20th Century - Japan in the 1990s, commonly referred to as the 'lost decade'. Consequently, inflation can prove more devastating for investors with long horizons on a cumulative basis, as the value of a portfolio would see steady erosion year on year. What we would therefore like to see is

nominal returns that are highly positively correlated with inflation. This reduces the volatility of the real returns of the asset, hence the better the inflation-hedging property, the more attractive it is as an asset for investors concerned with real returns.

Figure 1. US Inflation illustrated by the Consumer Price Index 1914 – 2009.



Source: US BEA

According to the US Consumer Price index in Figure 1, historical inflation averaged 3.3% annually from the beginning of 1914 through to the end of 2009. However, this number does not capture the volatile nature of inflation as it eradicates extreme data points. There were 10 separate years of negative inflation with the lowest recorded value being -15.8% in 1921, and five periods where inflation rates were measured in double digits, with the highest point at +23.7% in 1919. Such episodes however were far from common as most scenarios constitute short periods of moderate increases in inflation which were then corrected fairly quickly. Therefore we need to identify and single out these extremities and draw a conclusion on which asset classes have the most superior hedging ability.

Figure 2. Identifying Periods of Inflation, Deflation and Disinflation

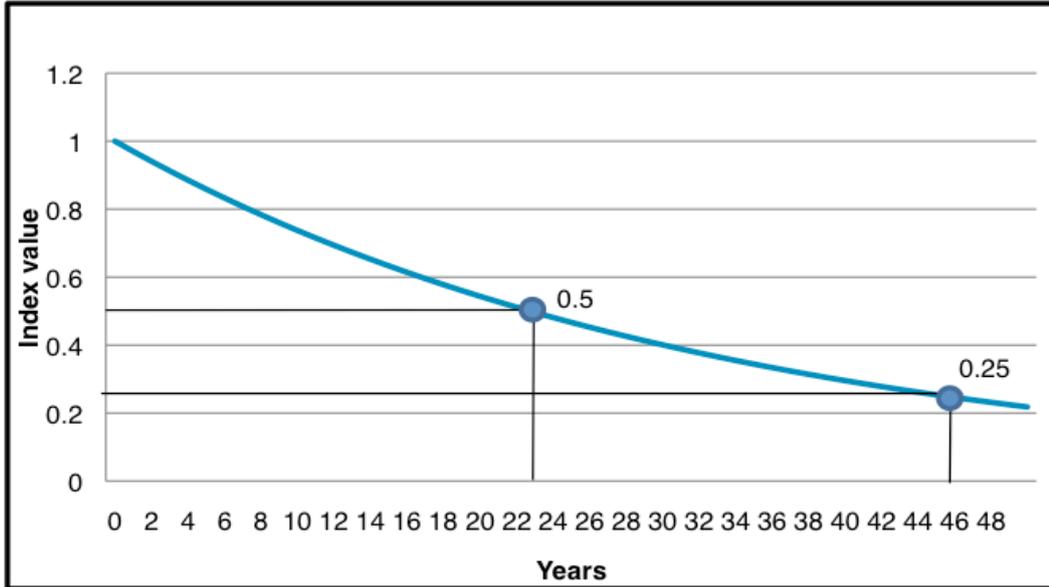
Periods of Inflation	Average Per Annum Rate
1913-1919: WWI	+9.7%
1945-1947: Post WWII release of pent-up demand	+13.1%
1949-1951: Korean War	+5.3%
1965-1971: Vietnam War build-up	+5.5%
1972-1982: Monetary expansion and higher energy prices	+8.6%
Periods of Deflation	
1919-1922: Post WWI Money Supply Contraction	-2.9%
1929-1932: The Great Crash & the Great Depression	-8.2%
1990-2000: Japan's Lost Decade	+0.7%
Periods of Disinflation	
1942-1945: WWII	+2.7%
1951-1965: Countercyclical Fed/Treasury Policies	+1.4%
1982-2000: The expanding Eighties & Nineties	+3.3%

High inflationary periods are relatively rare, outside of wartimes

Figure 2 illustrates that the most volatile periods occurred during and immediately after the First and Second World War, where prices fluctuated violently due to demands of warfare, but these may not necessarily reflect typical peacetime trends. So instead we will look to the 1970s as the most suitable representation of inflation, and for deflation we will use Japan in the 1990s alongside the

Great Depression of the 1930s due to the lack of data for all but the traditional asset classes from the early period.

Figure 3. Portfolio will halve in size roughly every 23 years



This chart exhibits the manner in which a zero yield portfolio would decay as 3% inflation takes its toll

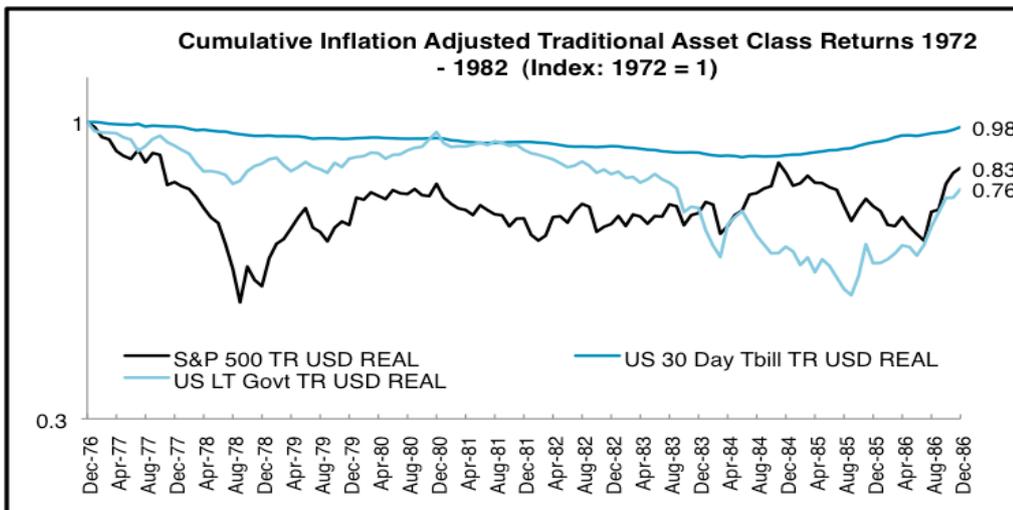
Source: Cerno Capital

As mentioned above, inflation is most harmful to long-term investors. Simple arithmetic would reveal that, an annual rate of 3%, a portfolio will halve in size every 23 years. Inflation risk cannot be avoided merely through conservative investing because even the safest asset class, cash, will be exposed to inflation to an extent. Therefore, there are strong incentives for an investor to seek assets that will be able to beat inflation in general.

We will start by examining the traditional asset classes.

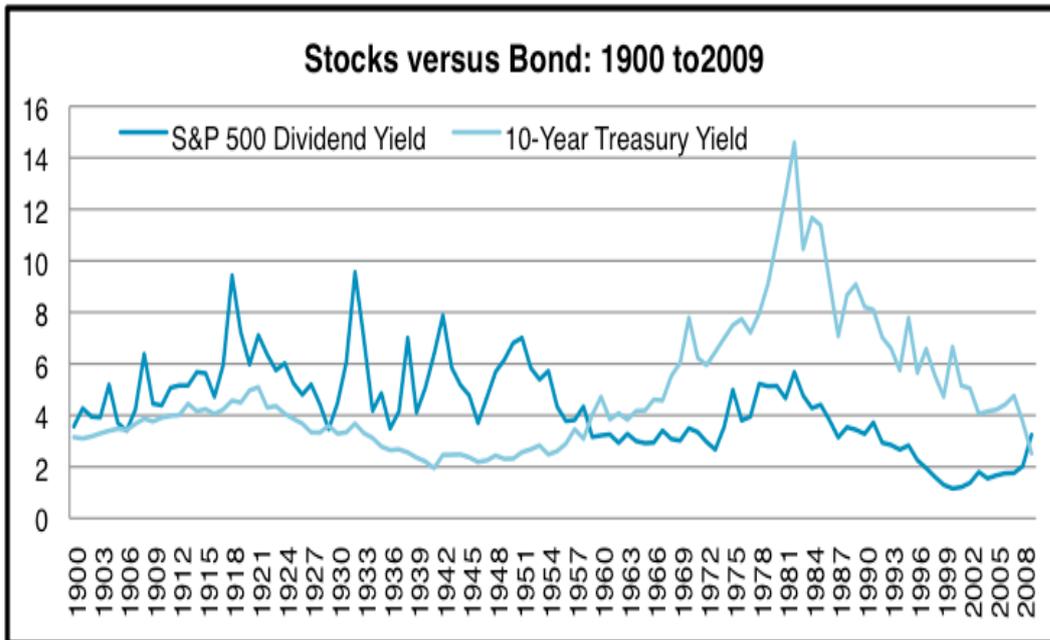
Traditional Assets: Equities, Bonds and Bills

Figure 4. Cumulative return on US asset classes (inflation-adjusted) during high inflation



Source: Encorr/Cerno Capital

Figure 5. Stock dividends versus 10-yr treasury yields in the past century

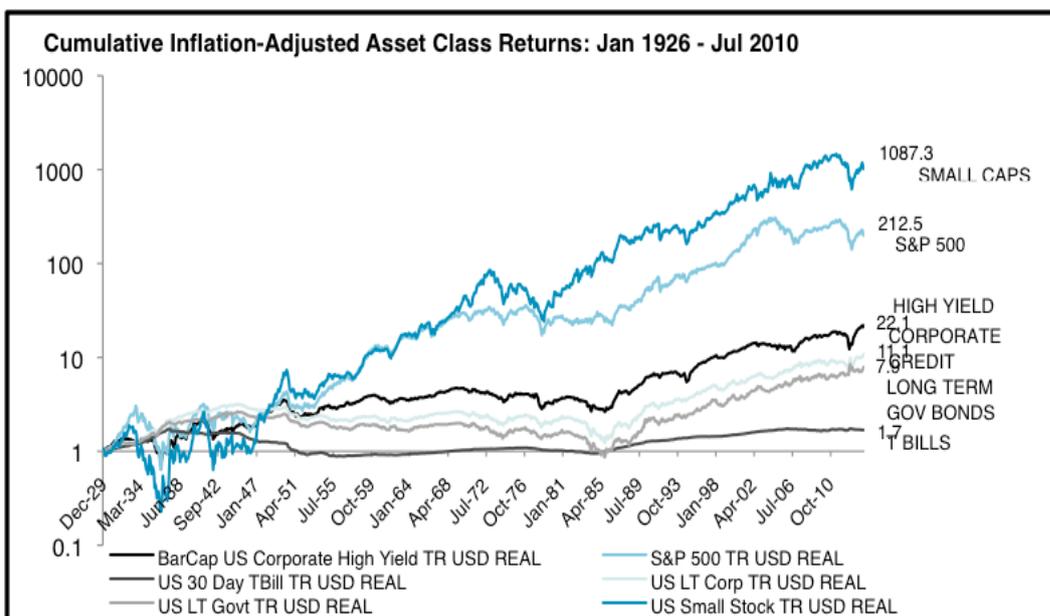


Source: Encorr/Cerno Capital

The longer term perspective is quite different and illustrates the remarkable hedging capacity of equities - especially small cap equities. Equities are the best financial asset in periods of rapidly increasing inflation. Over the past 95 years, US large and small cap equities significantly outperformed all other asset classes. An investment of US\$1 in 1926 would be worth US\$212 and US\$1,087, respectively, in 2010. Of course, inflationary conditions were not the only, and certainly not the most important, determinant of US equity performance in a century that can be fairly termed the American Century.

Large cap equities outpaced inflation, beating inflation by +6.5% per annum at an average inflation rate of 3.0%. The return from bonds on the other hand was not very impressive, increasing their value by just over 20 times principal, with corporate bonds outperforming government bonds at a per annum real rate of +2.9% and +2.5% respectively. Cash offered the weakest long term return at only 70%, returning +0.6% per annum, although it came closest to tracking inflation at its most extreme since inflation is often accompanied by a rise in interest rates.

Figure 6. Long-term cumulative returns on US asset classes (inflation-adjusted)



Source: Encorr/Cerno

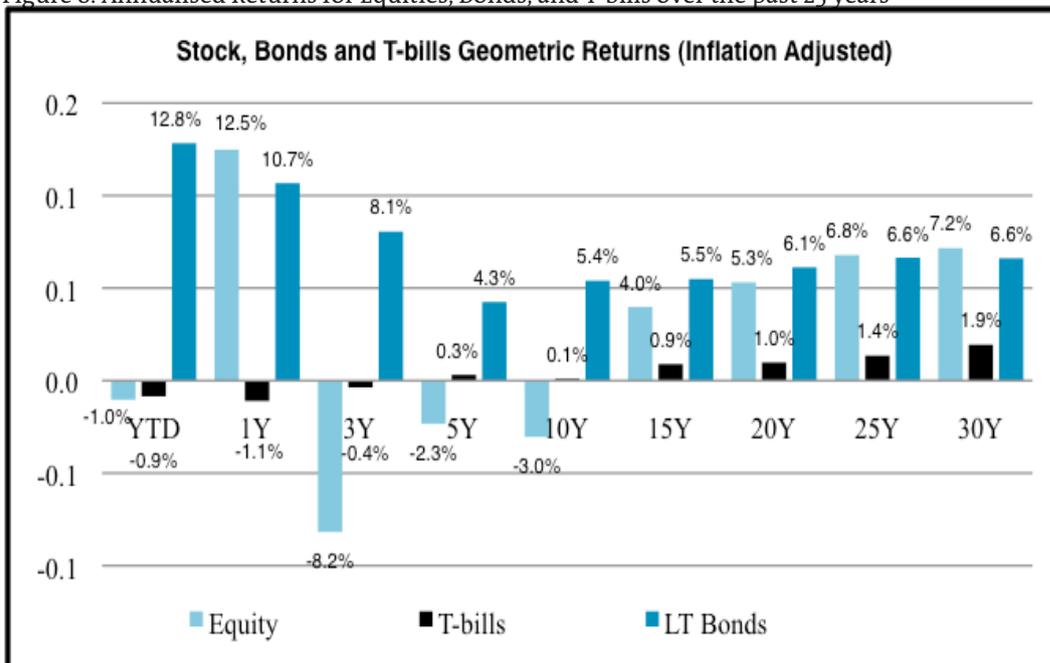
Despite the remarkable performance of US equities in the long run, the past twenty years, however, has seen a bull market for bonds, having outperformed equities for the past 20 years. This was achieved with much less volatility, as seen in the cumulative returns Figure 7 and the average returns in Figure 8 for these periods.

Nevertheless, if one anticipates moderate inflation for the future, then we should expect this trend to reverse. Equities have traditionally performed better than bonds during both moderate and high inflation and even the current bond rally would see no exemption to this rule, and therefore we still have reason to expect equities to outperform in the long term.

Figure 7. Cumulative Returns for Equities, Bonds, and T-bills

Asset Class	YTD	1Y	3Y	5Y	10Y	15Y	20Y	25Y
Equity	-1.0%	12.5%	-22.6%	-11.1%	-26.6%	79.7%	181.5%	415.9%
Cash	-0.9%	-1.1%	-1.1%	1.6%	0.9%	14.3%	21.6%	39.7%
Bonds	12.8%	10.7%	26.2%	23.1%	69.2%	122.9%	228.0%	399.4%

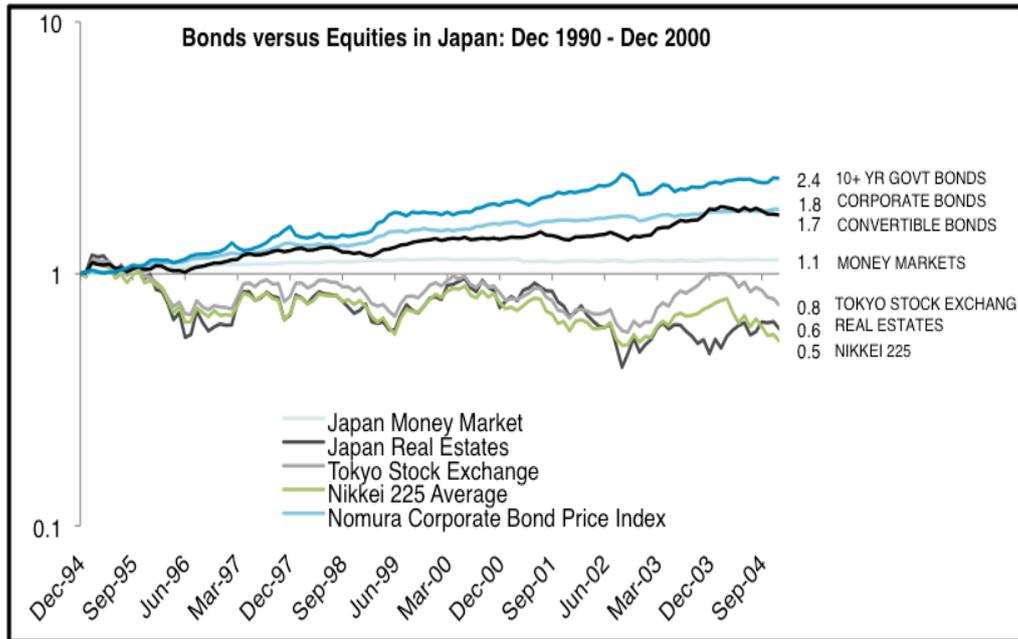
Figure 8. Annualised Returns for Equities, Bonds, and T-bills over the past 25 years



Source: Morningstar/Encorr

The reverse is true for deflation, reinforced by the chart on performances of bonds and equities in Japan during the 1990s. We see from Figure 9 that bonds significantly outperformed equities in that decade, during which the inflation rate remained stagnant at an average of +0.7% per annum. Yields on government bonds dropped from 8% to 1%, also driving returns on corporate and convertible bonds.

Figure 9. Bonds versus Equities in Japan during the 'Lost Decade'



Source: Morningstar/Encorr

By contrast, equities lost 46% of their value over the decade, with the Nikkei 225 index dropping from a height of 39,000 to a low point of 14,000 at its worst. Short term money market deposits maintained their value but earned negligible returns. Real estate values plummeted by 40%, almost on par with equities, a pattern mirrored in the Great Depression of the 1930s, when real estate and stocks declined alongside each other by 90% typically.

Another way of assessing asset class performance is to map their correlations to the level of inflation during high inflationary and deflationary periods in history, taking into account the performances of real assets including commodities and property, as well as traditional assets.

Figure 10. Quarterly Asset Class Correlations to US Inflation in different periods.

Correlation coefficient		Deflation	High inflation	High inflation	Moderate inflation	Stagflation	Disinflation
Asset Class	Index	1929-32	1941-43	1946-48	1965-70	1972-82	1982-00
Large Cap	S&P 500	0.1	-0.0	0.3	-0.4	-0.3	-0.2
Small Cap	IA Small Stock	-0.1	0.1	0.5	-0.6	-0.3	-0.0
Cash	3 Months T-bills	0.6	-0.5	-0.1	0.7	0.4	0.2
Gov bonds	IA SBB1 LT Govt Bonds	-0.1	0.4	0.1	-0.1	-0.4	-0.3
Corp bonds	IA SBB1 LT Corp Bonds	0.2	0.1	-0.6	-0.1	-0.4	-0.3
Convertibles	BoAML All Convertible bonds	-	-	-	-	-	-0.1
REITs	FTSE/NAREIT All REITs	-	-	-	-	-0.3	-0.2
Private Real Estate	NCREIF Property TR	-	-	-	-	0.3	-0.2
Gold	S&P GSCI Gold TR	-	-	-	-	0.3	0.0
Commodity	S&P GSCI TR	-	-	-	-0.2	0.1	0.4
Timberland	NCREIF Timberland	-	-	-	-	-	-0.1
US TIPS	Barclays Capital US TIPS	-	-	-	-	-	0.4
High Yield	Barcap High Yield	0.2	0.2	0.6	-0.2	-0.4	-0.2

Observations

- Equity prices displayed little sensitivity to inflation, having a low or even negative correlation for the majority of the periods listed above, regardless of the level of inflation. During the high inflationary periods of the 1940s and 1970s, prices were unable to keep up. Nonetheless, the annualised return of small capitalisation equities were +9.8% in real terms, outstripping large cap equities in the 1970s. Large cap equities outperformed bonds despite both asset classes having negative returns. The Goldilocks period for equities (both large and small cap) was of course the 1980s and 1990s, with +13% and +9% per annum returns – a period marked by falls in both inflation and real interest rates.

- However, during the Great Depression, government bonds rose by 15.5% whilst equities fell by -28.0%, on a per annum basis. High yield bonds were an exception, losing 5.8% annually, an indication that one would be well advised to own none other than the most pristine bonds during deflationary periods. Corporate bonds exhibited a higher correlation to changes in inflation during the period.

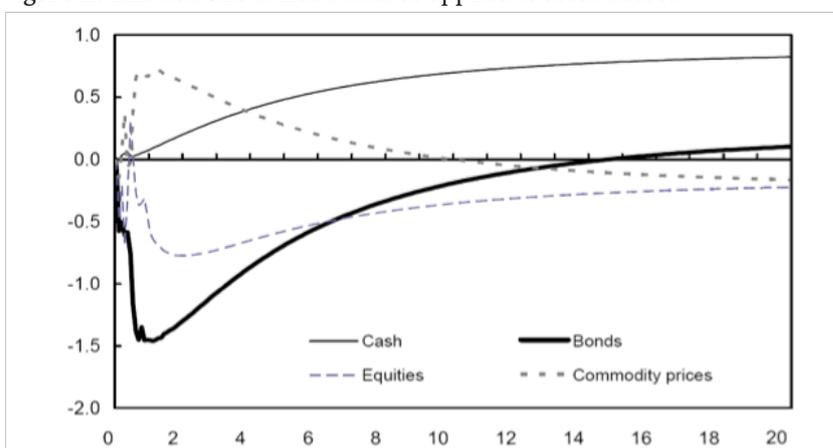
- During disinflationary environments, nominal bonds, both corporate and government, exhibited negative correlations to inflation. US Treasury Inflation Protected Securities (TIPS) had the greatest correlation of all the asset classes, due to their unique inflation indexing qualities, proving to be a better alternative on account of them being specifically designed for such purpose.

- Property, of all forms, has credible inflation protection credentials, albeit at a lag which corresponds to the rental reversion cycle. There are considerable disadvantages though, principally in the associated transaction costs and illiquidity.

- It appears that many asset classes cannot be expected to provide reliable protection against inflation over short time frames, such as one year. For medium term periods, say of between one to three years, real assets are superior protectors of value to financial assets, especially during inflation shocks. In the 1970s, during which inflation rose from 3.5% to 14.3% in just three years, most asset classes failed to deliver returns in excess of inflation. The exceptions were commodities, gold, and real estate, all of which exhibited a positive correlation to inflation, gaining an annualised +4.1%, +12% and +6.2% respectively, whilst equities and bonds shed value.

A recent paper by the IMF, “Inflation Hedging for Long-Term Investors.”, may shed some light on the long-term impact of inflation on asset classes. They employed a Vector Autoregressive (VAR) model to apply an inflation shock to traditional asset classes to test the impulse response on their cumulative total returns over a 20 years period. The figure below shows the initial reaction and the strength of recovery as below.

Figure 11. Inflation Shock Elasticities as applied to asset classes.



Defined as the percentage change in the asset class total return or price index ($\Delta \log z$) divided by the percent change in inflation

Source: International Monetary Fund

Cash showed a positive initial reaction to inflation with a small increase, but returns thereafter rose very slowly over a long period. Bonds also recovered, eventually, as returns began to be dominated by the consequential steady high yield, albeit they reacted badly following the initial shock. The worst performing asset class was equities. After reacting negatively to the initial shock, they failed to recover value over a 20 year period. Commodities were characterised as offering fair protection. They benefited from initially positive responses, but gradually lost their edge as the horizon drew out.

This clearly contradicts the advocates of long-term benefits of owning equities including the Equity Gilt Study by Barclays Capital, but this by no means undermines their findings, as the model fails to capture the changing economic conditions whereby equities may indeed recover their losses.

Real Assets: Commodities and Real Estate

Commodities and real assets are often hailed as portfolio hedges against inflation. Traditionally, these classes have exhibited a negative correlation to equities and bonds in the early phases of high inflation and high correlation to inflation on a short-term basis.

Indeed, part of this correlation is due to the positive feedback loop whereby commodities have the power to become a key driver of inflation. Over the course of the 1970s, for example, oil and gold prices rose by over 20% in real terms, while they experienced real declines over 5% over the disinflationary period between 1982 and 2000. Research by JP Morgan also suggests that should the US dollar weaken, currencies from commodity-producing countries such as Brazil, Canada, Australia and Norway will stand to benefit from the greater inflows of trade as commodities price rise.

However, it should be noted that the relationship between commodities and inflation has been historically unstable. Research by Watson Wyatt, which stretches back to 1970, reveals that commodities, as expressed by the Goldman Sachs Commodities Index, have actually been negatively correlated with inflation during the 25% of months when inflation was at its lowest. In addition the superior hedging ability was only evident during the 25% of months when inflation was at its highest. In other words, protect investors in times of high or rising inflation while exposing investors when it is low or in decline.

When modest inflation ensues, real assets are not necessarily the best hedging asset. This is due to the diverse nature of commodities as an asset class. Not all of the commodities will rise simultaneously during inflationary periods. Inflation driven by one particular commodity, such as oil, has the capability to dampen the price of other commodities. Secondly, commodities are not always affected by inflation, for example wage inflation would impact the price of finished goods and services without raising the price of the underlying commodities.

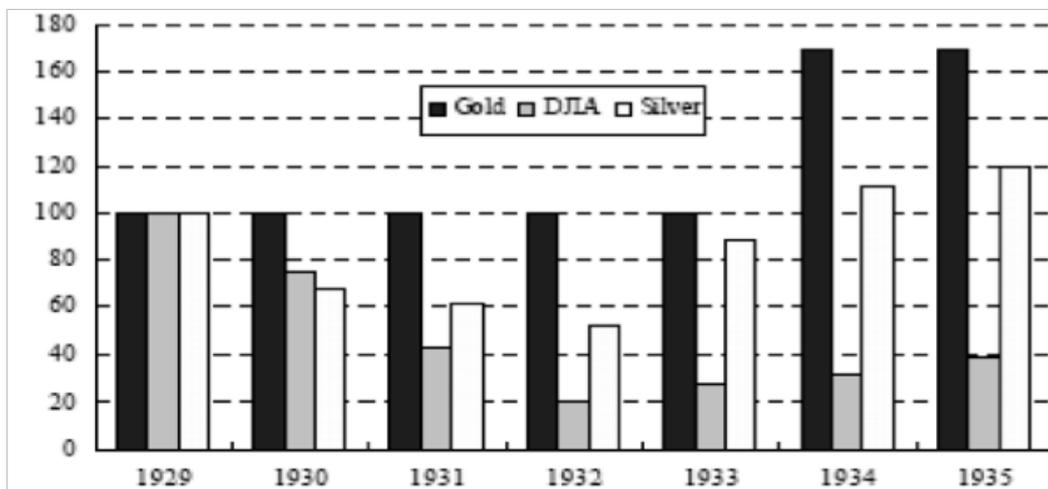
The risks associated with investing in commodities are still high as they have no inherent value beyond their market prices, so are dependent on investor perception and are prone to speculation, causing high volatility, which is especially true during inflationary periods, therefore there is a danger that they may be at their most risky just when they seem most appealing.

Gold, traditionally an inflation hedge, tend to have a more stable profile than other commodities. It is driven not so much by supply-demand fundamentals but by external factors such as dollar movements, oil prices, credit spreads, inflation and most importantly inflationary expectations (or fear). It represents a desire for investors to diversify into hard assets in times of uncertainty with fiat currencies, especially with the fall of the US dollar. This view was expressed in the words of John Pierpoint Morgan: "gold is money and nothing else".

In his book 'Stocks for the Long Run' Jeremy Siegel analyses investments over the past 200 years and concludes that gold, on average, maintains its value over time. However, US\$1 of gold bullion purchased in 1802 was worth US\$11.17 at the end of 1997. This is less than the overall change in price levels, implying that in the long-run, gold offers investors some protection against inflation, but little else, and that it could exert a considerable drag on the return of any long-term investor's portfolio. By contrast, (US) stocks have been appreciating at an average of 6.5% over the over long-term rate of inflation. In this respect, investments in hard asset stocks would give you the stability of a real asset plus higher market returns.

It is difficult to measure the hedging ability of gold during deflation due to the fixed currency regimes that persisted. This problem can be resolved if we choose to proxy gold with another precious metal – silver. Silver can also be regarded as currency in some respects, and with floating market prices existing for the 1930s, it can reveal more about the likely movement of gold during deflation.

Figure 12. Gold & Silver versus Dow Jones Industrial Average (DJIA) during the Great Depression



Source: JP Morgan

Figure 12 show how, after peaking in 1929, the DJIA fell sharply, losing 80% of its peak value. Because of its fixed price in dollars at that time, gold was unaffected. Silver fell too, but it significantly outperformed the reported DJIA on the way down. What is also encouraging is that after the deflation bottomed in 1932-1933, silver bounced back much more quickly, and by 1934 it was already higher than its 1929 level. Intriguingly, gold seems to parallel this with its re-pricing to US\$35/oz in 1934. This seems to suggest that even after a very tough period of deflation, a bounce-back significantly helps the precious metals. With modern economists already pointing to the money presses as the best medicine against deflation, any post-deflation precious metals bounce is likely to be more vigorous.

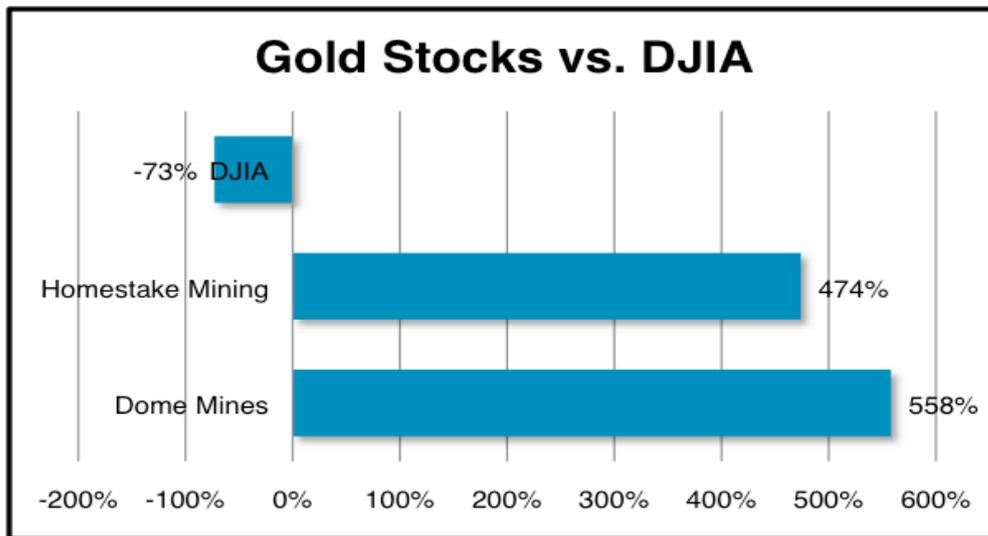
The hitch with these types of conclusions, based as they are on a single asset market, is sample bias. We proxy the US for the world when perhaps we should be doing no such thing.

It is rare that an asset class offers a hedge against both inflation and deflation, but gold may be one such example. Moreover, gold stocks fared remarkably well during the Great Depression too. The bar chart in Figure 13 shows the performance of two of the largest gold stocks against the DJIA.

Despite the fact that the gold price was fixed at the time, the price of these gold stocks soared. The stock of the largest Canadian producer Homestake and the stock of the largest US producer Dome Mines advanced 558% and 474% respectively. The dramatic rise in gold stocks contrasts sharply with the Dow, having lost 73% of its value during that period. Moreover, both companies paid healthy and rising dividends as the depression wore on: Homestake's dividend rose from \$7

to \$15 per share, and Dome's from \$1 to \$1.80. The price movements in gold represent the shift in sentiment from wealth generation to wealth preservation. Moreover weakening of prices would be far less on a relative basis to most other commodity sectors or across the asset classes in general, making it an all round sound investment to own before any deflationary occurrence.

Figure 13. Gold Stocks versus Dow Jones Industrial Average during the Great Depression



Source: Casey Research

In spite of superior performance under extreme environments, gold is not the best choice of assets to own in disinflation or moderate inflation, where price stability is apparent. During the disinflation of the 1980s, gold displayed essentially a zero correlation with inflation, as opposed to the positive high correlation under other conditions, meaning that when there is not an immediate need for wealth preservation the appeal of gold diminishes altogether.

Commercial real estate was another asset class among the best performers for the 1970s, providing an excellent inflation hedge. Not only did it manage to retain its value, but earned a positive 6.0% annualised return, which contrasts sharply with traditional asset classes. On the other hand, REITs performed dismally, earning a negative annualised return of -2.2%, comparable with the -3.6% of equities. But commercial property differs from the characteristics of real assets.

It is essential to consider property (or real estate) in terms of two subcategories: direct investments and investments into real estate equities. The correlation study revealed that the two subclasses behaved very differently during the high inflation of the 1970s and the subsequent disinflation beginning the 1980s. Real Estate Investment Trusts (REITs), proxied by the FTSE/NAREIT index, exhibited the same negative relationship found in equities, which both stood at -0.3, direct investments on the contrary, displayed a positive correlation (0.2) to inflation. Therefore we can infer that direct investments are a far better option than real estate equities during high inflation. The latter represents, to a large degree, the investment into the underlying real estate company, whereby a large sum of the income comes from administrating the sales, in which a fixed proportion (90%) must be paid back to the shareholders. The high volatility is also akin to those of equities (Figure 15), making REITs appear to be a perverse hedge against inflation.

For direct investments into real estates, there is evidence that inflation hedging properties exist. Academics Demary & Voigtländer concluded from their recent paper 'The Inflation Hedging Properties of Real Estates (2009)' that investment into residential estate and commercial real estate - office properties in particular - yields the best return during inflation whereas retail properties proved to be inferior hedges. Open investments in real estate perform better than bonds and stocks during inflation. Furthermore, for long horizons, real estate curbs unexpected inflation as well as

the hedging benefits of commercial property have a significant time-lag component. In the short-term, property rents are generally fixed (though revenue related retail rents and similar structures are an exception). However, as leases come up for renewal, they tend to catch up with inflation, since they tend to be tied directly to the consumer price index – though the extent of the catch up can be offset by the decline in economic activity caused by inflation.

Figure 14. Subclasses of Real Estates versus Equity performance during inflation

Asset Class	Correlation 1978-82	Average Return 1978-82 (%)	Correlation 1978-10	Average Return 1978-2010 (%)
Office	0.2	9.0	0.4	4.0
Retail	0.0	1.0	0.1	5.1
Commercial	0.2	6.1	0.3	4.6
Residential	0.4	-1.6	0.2	0.5
REITs	-0.3	8.4	0.1	6.3
Equities	-0.3	4.2	0.0	6.7

Residential property recorded the highest degree of positive correlation coefficient (0.4) at the height of inflation, which may be due to the fact that home owners have more power in re-optimising rents, resulting in more robust returns. However, surprisingly the return over the same period was grim: the only negative reading among all the sectors in the table. This trend continued for the entire period (1978-2010) as it had the lowest overall return, underperforming its peers in the real estate sector and beaten by REITs and equities, even though it managed to outperform inflation by a margin.

In the short-run, there seems to be little adjustment to an inflation shock; however, in the long-run their hedging ability prevails as cumulative returns all surpass those of equities, with REITs giving the best performance. Deflation spells disaster for real estate, evidenced by Japan, as the sector lost even more than equities in the 1990s. Even disinflation is undesirable, characterised by the real estate recession between mid-1980s to mid-1990s, where nominal returns averaged an unimpressive +3.9% per annum.

Conclusions

It is critical to have a long-term perspective. In the short-term, no asset class can hedge inflation perfectly. But as the effect of inflation is most detrimental on a cumulative basis, long term portfolios should hedge appropriately. Whilst there are no perfect hedges against inflation, there are some rational investment responses to combat inflation concerns.

Equities are very plausible in this regard. Historically, while they may be more subject to loss of principal than other asset classes, they have traditionally been portrayed as a good inflation hedge not only because of their superior returns over time, but because their earning streams are capable of adapting and keeping up in an inflationary environment. However, this seems to only be achieved in long time horizons since the transfer of rising costs cannot be offset within a short time span. Additionally, equities tend to perform best when inflation is moderate or in decline, but their benefits can be somewhat offset when coming under stress in extreme market conditions.

Nominal bonds are notably less attractive for an investor concerned with inflation, since they prove to be most sensitive to high inflation in a negative manner. In spite the guarantee of principal and interest payments, they provide no protection against the erosion of future purchasing power from these payments since a rise in inflation and interest rates diminishes the price of the existing bonds, rendering the future interest payments significantly less valuable, and thereby discount the present value on its future cash flows in general. When there is uncertainty about the macroeconomic outcome, shortening the horizon of the bond holdings would serve to limit

the potential capital losses to an extent. But the most noteworthy quality of bonds is its ability to withstand deflation when most other asset classes devalue drastically, as exhibited during the Great Depression and during the 'Lost Decade' of Japan. However this is only true when there are no defaults, therefore one should only buy the most credit-worthy government bonds from developed countries to counteract the impact of deflation.

Inflation-linked bonds such as Treasury Inflation Protected Securities (TIPS), designed specifically for the exact purpose of combating inflation, are expected to offer far more appealing returns. It should be especially effective in immunising investors from unexpected inflation. Any short-term volatility should not be of concern for investors prepared to hold these assets to maturity. However, restrictions regarding practicalities such as liquidity limit its appeal to investors, and the fact they came into existence fairly recently (1997) does not allow for an in-depth study of the realistic behaviour of this instrument in extreme markets. Should real rates rise, inflation indexed TIPS would still be expected to outperform nominal treasuries regardless if it suffer losses in absolute terms. The price of TIPS in public markets tends to reflect their insurance value and, if this renders them as overvalued in an absolute sense, then an alternative approach is to be long the TIPS and short the nominals, where possible.

Whilst cash is an excellent protection against short term shocks, it produces the lowest returns in the long-term. In periods of inflation cash tends to deliver a loss of purchasing power over time and lose money in real terms. Having said that, from 1972-1982 cash still retained the majority of its value, in stark contrast to the other traditional asset classes. For deflation, the clear objective is to preserve capital, and therefore the preference would lean towards safer assets. No asset is safer than cash. Even though cash returns less than bonds, the single most important advantage of having cash during deflation, apart from preventing loss of capital, is its lucrative ability to generate future wealth from seizing the opportunity to invest in under-valued assets at a discount.

Commodities and real assets are far better correlated during inflation in the short term in comparison with equities. Their unique supply and demand pattern gives them the power to become a key driver of inflation, which can in turn, push up their prices. However they are also extremely volatile, thus investing in a basket of commodities is often a better choice than investing in individual commodities, with the exception of gold. The downside for this asset class is the dissipation of their hedging potential once we surpass the height of inflation, and they lose some of their hedging benefits if higher inflation leads to lower real economic activity. They tend to underperform inflation when it is low or in decline, and their long-term ownership is by no means favourable to one's portfolio, as seen during the disinflationary era between 1982-2000.

Gold, silver and precious metals in general can in fact be good inflation as well as deflation hedges. Even if they weaken, they will still do so less than most other commodities on a relative basis, and definitely less than stocks that have the possibility of losing 90% of their value. Furthermore, if the reserve currency declines sharply, the best investment tends to be gold, due to its unique linkage to currency, which will push up prices upon speculation, or fear, of inflation.

Finally, there is evidence for private real estate as an inflation hedge, at least partially, depending on the subclasses invested in. Note that whilst real estate does tend to retain value over longer periods, over most periods measured, its returns tend to fall short of equities. Securitised real estate (REITs), however, behaves much more like equities during periods of high inflation.

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